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17 February 2014

Via Email and Federal Express

Ms. Sharon Fang (3H521), Remedial Project Manager
U.S. Environmental Protection Agency – Region III
1650 Arch Street
Philadelphia, PA 19103

Subject: **Revised Intermediate (60%) Design Submittal / Pre-Design Investigation Report & Preliminary Remedial Design (Revised 60% Design) dated 17 February 2014, and Responses to 27 January 2014 USEPA Comment Letter**
Operable Unit 2 North Penn Area 5 (NP5OU2) Superfund Site
Unilateral Administrative Order (UAO)
Docket No. CERCLA-03-2012-0205DC

Dear Ms. Fang:

On behalf of Stabilus, Inc., please find enclosed three (3) copies of the Revised Intermediate (60%) Design Submittal / Pre-Design Investigation Report & Preliminary Remedial Design dated 17 February 2014 (Revised 60% Design) to fulfill the requirements of Section VI Paragraph 25.b of the Unilateral Administrative Order (UAO) Docket No. CERCLA-03-2012-0205DC dated 26 June 2012, for the interim remedy for Operable Unit 2 (OU2) of the North Penn Area 5 Superfund Site. A redlined version of the Revised 60% Design text was submitted via electronic mail.

RESPONSE TO COMMENTS

Below is a summary of the responses to comments to the 60% Design that were provided by USEPA to in a letter dated 27 January 2014 and were discussed during technical meeting calls on 22 and 23 January 2014 (note: USEPA's comment is presented in italicized text followed by the response):

General Comments

Comment 1: *Treatment of all areas required by the ROD must be included in the design. If Phase 1 is not successful, a schedule and associated deliverables should be committed to here for a Phase 2 process. Insert language in pages 24 & 26.*

Response: Agreed. As noted in the Remedial Design Work Plan dated 29 January 2013 (RDWP), this will be addressed within the Pre-Final Design Submittal (90% Design), which

will present the remedial action (RA) schedule and the deliverables related to the RA. Text on pages 24 and 26 has been modified based upon this understanding.

Comment 2: *Include Phase 1 Failure criteria as agreed upon in our 1/22/14 call: no TCE decrease, no daughter product generation, and the inability to physically inject. If the Phase 1 failure criterion is not triggered, Phase 1 will be optimized using performance metrics as presented in our 1/22/14 call and Phase 2 will be designed accordingly. Add deliverables and schedule for Phase 2 in the design. This design is to address the entire interim remedy.*

Response: Agreed. As defined in the RDWP, the RA schedule is part of the 90% Design. As discussed and as will be described in the 90% Design, the major deliverables will be an Annual Monitoring Report – Year 1 and Year 2, and a Phase 1 EISB Remedy Performance Report following the submission of the Year 2 Annual Monitoring Report which will provide determination of success or a declaration of failure of the Phase 1 EISB Remedy.

Comment 3: *The Basis of Design Report does not provide a project delivery strategy or how RAOs will be met if Phase 2 is not implemented.*

Response: As discussed during the 22 and 23 January 2014 technical calls, the project delivery strategy will be presented within the 90% Design. Additionally, a Revised Basis of Design Report will be included to further refine how the RAOs will be met if Phase 2 is not implemented.

RPM Comments

Comment 4: *Include a Focused Feasibility Study as part of deliverables the "if Phase 1 fails"*

Response: Understood. A Focused Feasibility Study (FFS) will be prepared 90 days following USEPA's approval of Failure Determination of Phase 1 as noted in Section 9 and will be furthered detailed within the 90% Design. The FFS will include assessment of viable OU2 overburden treatment remedies.

Comment 5: *Page 4, §2.1.1 states area located on Stabilus & BAE. Add "in the vicinity of Stabilus & the former BAE facilities and Whistlestop Park."*

Response: Agreed, text has been modified.

Comment 6: *Figures 3 & 4 Label Whistlestop Park and the Former BAE.*

Response: Agreed, Figures 3 and 4 have been revised.

Comment 7: *Figure 6. Draw an open contour to the left of TW49 & TW50 or dash the line and add dashed line to the legend as "approximated extent, not yet confirmed."*

Response: Agreed, Figure 6 has been modified.

Comment 8: *Page 23, fourth bullet states "soil concentrations for VOCs are very low and only slightly exceed the USEPA Region 3,6,9 PGW-MCL value for TCE of 0.0018ppm. SB06 had a TCE concentration of 0.12, which is not "slightly" above the PGW value. Other concentrations are 0.087, 0.037, 0.049 and 0.037. Fix language to be more appropriate.*

Response: Language has been changed as requested.

Comment 8: *Table 6 does not list the unit of the reported data.*

Response: Disagree. Table 6 provides the units of mg/kg.

Comment 9: *Page 35. Design Assumptions should include the assumption that injections will only take place during warm months, therefore heat tracing of construction below the frost line are not considered.*

Response: Agreed. Will be incorporated into the 90% Design.

Comment 10: *Page 36 assumes 50' radius of influence. The performance monitoring network does not appear to cover that assumption.*

Response: As discussed during the 22 and 23 January 2014 technical calls, the 90% Design will present the means by which donor transport within the 50-foot radius of influence will be monitored / confirmed.

Comment 11: *Page 37 text states a 20,000 gallon frac tank. Make Drawings 5 & 6 consistent with this volume.*

Response: The 90% Design drawings will be revised as requested.

Comment 12: *Page 37. Sample and analyze the water pumped from RI-27D both before pumping and after pumping and also sample and analyze the water in the frac tank. Pumping from the aquifer may need to be coordinated with DRBC. State a contaminant threshold (e.g. MCLs) above which the water from RI-27D cannot be used. Provide a contingency plan in case this scenario is triggered.*

Response: The text on Page 37 has been modified. Further details regarding the use of RI-27D, sampling requirements and contingency for water will be provided within the 90% Design.

Comment 13*: Section 5.4. Include details on how the permit equivalencies will be coordinated and met should be elaborated on. As a FYI, our UIC program reviewed the document and*

commented as follows: "the proposed design of the infiltration trenches do meet the definition of "injection wells" since they are deeper than their largest surface dimension. The operator needs to characterize the injection fluid and ensure that the injection process does not negatively impact the ground water or any nearby water wells. If the project proceeds as proposed, please forward me the specifics of the injection process so that it can be inventoried in the UIC data base."

Response: Permit equivalences will be included within the Permitting Requirements Plan as part of the 90% Design.

Comment 14: *Page 39, Section 5.3. Explain how the "Prevent or minimize migration" RAO will be addressed.*

Response: The text on Page 39, Section 5.3 has been modified.

Comment 15: *Additional Specifications (Page 41) may be needed, e.g. excavation, gravel, trenching, geotextile, sediment erosion control, etc.*

Response: Additional Specifications will be included within the Pre-Final Specifications as part of the 90% Design.

Comment 16: *Page 49, Performance Monitoring Reporting. A cumulative summary should be attached to the monthly report as soon as the new data is available.*

Response: The text on Page 49, Section 8.10 has been revised.

Comment 17: *Page 50, RA Schedule. Gantt Chart showing critical path is expected in next submittal.*

Response: Agreed. As outlined in the RDWP, the Pre-Final Construction/Remedial Action Schedule will be provided within the 90% Design. The Phase 2 EISB 90% Design will be submitted within 90 Days from the EISB Remedy Performance Report (ERPR) which will include: Revised Drawings showing the Phase 2 and performance well network; Revised RA schedule; Revised 90% Design which includes revisions as necessary for the expanded application of EISB within the OU2 overburden groundwater aquifer. Further details of the RA schedule will be provided within the 90% Design.

Comment 18: *Page 50, RA Schedule. Will only intermediate bedrock wells be installed in 4th Qtr 2014 or shallow bedrock wells that will not be impacted by the trench construction also?*

Response: Only the intermediate bedrock wells will be installed in the 4th Quarter 2014 under the current schedule. The shallow bedrock well depths will be based upon

information from the installation of the intermediate bedrock wells. Further details relating to the schedule will be presented within the 90% Design

Comment 19: *Page 50, RA Schedule. Provide "decision on success/failure in the 3rd Qtr of 2017" and "Construct Phase 2" for 4th Qtr 2017, thereby allowing the two year of monitoring Phase 2 to end in 4th Qtr 2019. Ten years of annual sampling will be 2019 through 2027.*

Response: As discussed during 22 and 23 January 2014 technical calls, the long term sampling will end in 2027, text has been modified. The decision on success / failure will be refined within the 90% Design.

RPM comments, Appendix H, Design Drawings

Comment 20: *Cover sheet. Label roads so that the location of the Site can be determined.*

Response: Agreed. Will be incorporated into the 90% Design.

Comment 21: *Sheet 2 Delete TW locations. This sheet should be existing Site features; the TW locations are no longer in place. Assign numbers to the topography contours so ground surface can be understood from this figure.*

Response: Agreed. Will be incorporated into the 90% Design.

Comment 22: *Add a Sheet with RD features & summarizing PDI data. This is where TWs locations and TCE contours.*

Response: Agreed. Will be added as part of the 90% Design.

Comment 23: *Drawing 3. Place RI23 & RI25 on sheet as referenced in the design text.*

Response: Agreed. RI23 and RI25 will be added to the design drawings within the 90% Design.

Comment 24: *Drawing 3. The Phase 2 injection trench that is depicted on Drawing 3 does not pass within 50 feet of the 100 ppb TCE contour in multiple areas. This is significant because the design document assumes a 50 foot radius of influence (ROI) for the EVO injection. To implement the remedy as specified in the ROD, injection of the EVO and associated amendments that will be used to achieve the enhanced bioremediation remedy must take place no farther from the 100 ppb TCE contour than the injection ROI. Relying on natural attenuation to address a portion of the contamination within the 100 ppb TCE plume is not in keeping with the requirements of the ROD. Based upon the results from the Phase 1 injection, remaining areas above 100ppb in the overburden are expected to be designed in Phase 2.*

Please add the following note to Drawing 3: "Final placement of the Phase 2 injection trench(es) will be determined based on data from Phase 1 and will be documented on design drawings for Phase 2 of the remedy."

Response: Agreed. The performance monitoring of the Phase 1 trench will be designed to confirm the 50 foot ROI. Modifications to the drawings will be incorporated into the 90% Design.

Comment 25: *Drawing 4. Equipment should be inside a locked fence and a Site sign should be posted.*

Response: Agreed. Will be added as part of the 90% Design.

Comment 26: *Drawing 6 shows the trench at 3.5' wide. Fix the scale if the trench is to be 5' wide. Also, show expected groundwater table elevation on cross section. It's unclear if the groundwater table is expected to be within the pea gravel or above the clean fill/geotextile.*

Response: Agreed. Will be clarified within the 90% Design.

Comment 27: *Drawing 7. Add a contingency that the overburden monitoring wells will be reinstalled if the location drilled is found dry.*

Response: Agreed. Will add a note to the drawing as part of the 90% Design.

Comment 28: *Drawing 7. Unclear if some locations will have both shallow and intermediate wells constructed in the same borehole.*

Response: Shallow and Intermediate wells will be constructed in separate boreholes as detailed in the narrative. The clarified drawings, specifications and schedule will be submitted as part of the 90% Design.

Hydro Comments

Comment 1: *Page 15 and Figs 6 and 7. It is stated here that there are two distinct source areas and two distinct plumes, based presumably on the lower TCE and DCE concentrations in TW04. However, due to the variability over relatively short distances, the orientation of the plume on the Stablius property and the orientation of the bedrock topography, there could be higher concentrations east of this point and west of TW 12. Without this additional information, these conclusions are speculative.*

Response: The data indicates that there are two distinct vintages of TCE, and the TCE and DCE data indicates that the resulting plumes have two areas of elevated concentrations. The lines of evidence supporting two sources were discussed within the narrative including the

CSIA data indicating the clear presence of two vintages of TCE, as well as the historic observations of TCE in this area prior to Stabilus and the two elevated areas of VOCs that have co-mingled over time. As discussed during the 22 and 23 January 2014 technical calls, the language on Page 15 has been modified.

Comment 2: *Page 26 from the general sequence of the EISB provided, it is unclear when well installation and baseline sampling will occur and at what points monitoring will occur.*

Response: Will be clarified within the RA Schedule as part of the 90% Design.

Comments 3: *Page 36. Provide the basis for the 50' radius of influence.*

Response: As discussed during the 22 and 23 January 2014 technical calls, the 50-foot ROI was assumed to afford sufficient injection of buffered EVO that could migrate that distance. The 90% Design will present the means by which donor transport within the 50-foot ROI will be monitored / confirmed.

Comment 4: *Pages 42-44 Please provide the proposed well locations on one of the figures with water elevation contours and contaminant concentrations. No comments can be provided without this information.*

Additionally, it is noted on page 44 that two wells will be completed southwest of the EISB area to assess dip and spread of the EISB within the bedrock. I believe that the dip is to the northwest. Please clarify.

Response: As discussed during the 22 and 23 January 2014 technical calls, a figure showing the proposed well locations with water elevation contours and contaminant concentrations will be provided as part of the 90% Design. The bedrock formation below the OU2 overburden aquifer has a strike of N62^{o}E and a dip of 27^{o}NW.

Comment 5: *Section 8.3.2 Please modify to include work described in section 8.7. Additionally, it is recommended that the intermediate boreholes are installed and tested prior to installing the shallower holes.*

Response: Agreed. As noted in the narrative, the intermediate wells are being installed first to inform the depth for the shallow wells. The geophysics and packer testing are only being completed on the intermediate wells which are also noted within the text. Section references for the geophysics and packer testing have been added to Section 8.3.2.

Comment 6: *Pages 48 and 49. Is the LTM referred to on page 26 the same as this two year monitoring? If these analyses refer to LTM, would it not be possible to determine success or the*

need for amendments before the end of the 2 year monitoring period? The timing of the Phase I RA report should be indicated.

Response: The total of long term monitoring (LTM) is 10 years for EISB monitoring. The first 2 years of LTM will be completed as part of Phase 1, and the remaining 8 years of LTM will be completed as part of Phase 2. A refined RA Schedule will be presented within the 90% Design.

Comment 7 (Requested during 22 and 23 January 2014 technical calls): *Request that RI33S/I be moved south in line with the dip of the fracture, as well as the addition of an intermediate well added to RI35S to assess gradients within bedrock.*

Response: The request to move RI33S/I and addition of RI35I was agreed to during the 22 and 23 January 2014 technical calls. Text within Section 8 has been modified to reflect the addition of RI35I. The drawings will be updated as part of the 90% Design.

ORC Comments

Comment 1: *P.25 states the equipment for the EISB will be placed near the "former loading dock," but then later indicate that area to be on the northwestern side of the building (the left if you are looking at the building from the rear). Please clarify.*

Response: Correct. The EISB remedy will be placed near the "former loading dock". The staging area for the treatment components (tanks, mixing, etc.) will be located northwest of the building as shown on the design drawings. Further clarification will be provided within the 90% Design.

Comment 2: *Last bullet on p.34. does not have a place in a technical document.*

Response: Assume the comment is for Page 35, and yes it does have a place in a technical document, as the addition of a PRP for a second source on that PRPs former property would affect how the remedy is implemented and the schedule of implementation, which is a component of the technical submittal.

HGL Comments

General Comments

Comment 1: *Complete a thorough editorial review, as numerous instances of awkward wording and grammatical errors were observed throughout the document.*

Response: Understood.

Comment 2: *Section 3 presents the soil results but does not evaluate whether the TCE detections could represent historical sources of contamination associated with the plume. Please provide an analysis of the soil data.*

Response: As noted in the RDWP and the FSP, the soils samples were collected to understand the base load of VOCs for EVO and not to understand the origins of the TCE.

Comment 3: *Present a contingency approach that will be used to achieve the RAOs in case Phase 1 results are determined to constitute a failure and Phase 2 is not implemented.*

Response: The contingency approach will be presented within the 90% Design.

Comment 4: *The treatability study data analysis concluded that a buffered EVO amendment is required. For the treatability study, buffering was provided through sodium bicarbonate addition. Section 5 specifies how much EVO solution will be required, but does not discuss how this solution will be buffered. Will sodium bicarbonate or some other buffer be added to the EVO solution to reflect the findings of the treatability study that the buffered amendment outperformed the unbuffered amendment addition. If so, how much buffer will be included in each batch of EVO solution?*

Response: The EVO solution, buffering and other details will be furthered refined within the 90% Design.

Comment 5: *The design radius of influence for the injection trench is 50 feet. Given the low permeability of the soils encountered, this might be optimistic. Additionally, from the description of the overburden monitoring well network in Section 8.2.1, it is not clear that any of the wells will be positioned to confirm that the amendment influence extends 50 feet from the trench. On the contrary, the detail on Drawing 3 of Appendix H indicates that all of the new overburden monitoring wells to be used in Phase 1 are located within 25 feet of the trench. The text in Section 8 indicates that the new overburden wells will all be within 20 feet of the trench. On Drawing 3 in Appendix H wells RI23 and RI25 appear to be farther than 50 feet from the application trench and are placed closer to the trench ends where the document indicates that the affected radius will be smallest. Please describe how the planned monitoring program will confirm the design radius of influence.*

Response: The performance monitoring of the Phase 1 trench will be designed to confirm the 50 foot ROI. As noted within the RDWP, details of the monitoring program will be included within the RA Field Sampling Plan as part of the 90% Design.

Comment 6: *Please indicate how much KB-1 inoculum will be added to the trench and the basis for the quantity.*

Response: As outlined in the RDWP, the details of the KB-1 bioadmendment will be presented within the Operation and Maintenance Plan (O&M Plan) as part of the 90% Design.

Comment 7: *Please indicate how the trench spoils will be managed, including how saturated spoils will be decanted, how spoils will be stockpiled and managed pending waste characterization and disposal, and how backfill will be stockpiled. Further, the site layout map (Drawing 3 of Appendix H) should indicate the location of the spoils management areas and laydown yard.*

Response: As outlined in the RDWP, the management of the waste will be presented within the RA Waste Management Plan as a component of the 90% Design.

Comment 8: *Discuss the potential impact of the trenching on the Constantia building and other surface features. Include a structural analysis of the soil in the area of the building.*

Response: As noted during the 22 and 23 January 2014 technical calls, this will be a component of the RA Contractor's work for locating of the trench in agreement with the building owner (Constania-Colmar, Inc). Further specifications or details surrounding this requirement will be included within the 90% Design.

Comment 9: *Indicate that all wells will be constructed developed, and abandoned in accordance with all applicable Pennsylvania well drilling regulations and EPA guidance for groundwater monitoring well construction.*

Response: This will be clarified within the Pre-Final Specifications submitted as part of the 90% Design.

Comment 10: *Using the analytical results from only one sample to provide the geotechnical characteristics for the entire site is questionable from an engineering standpoint. Consider performing additional geotechnical analyses to ensure that the observed characteristics (particularly permeability) are applicable to the whole site.*

Response: Agreed. This was work completed to verify the visual observations. As discussed during the 22 and 23 January 2014 technical calls, additional geotechnical analysis will be completed as part of the RA implementation.

Specific Comments

Comment 1: *Page 5, Section 2.1.2, first paragraph – The description of the overburden as being between 10 and 40 feet thick appears to be inconsistent with the information contained in Table*

1, Table 7, Figure 9, and Section 2.1.3. Overburden thicknesses listed in Table 1 and derived from Table 7 and Figure 9 show a maximum of approximately 30 feet (at TW-10). Please verify the thickness of the overburden and correct the text as necessary.

Response: Text has been modified. This description was a carry-over from the prior USEPA RI/FS text.

Comment 2: *Page 5, Section 2.1.3, first paragraph – Given that groundwater occurs at the bedrock/overburden interface, the language in this section indicates a maximum overburden depth of 20 feet. Please review the following language and correct/clarify as needed: "The thicker sections of overburden, such as those in the vicinity of the former BAE and former Stabilus properties, have historically contained a saturated zone of approximately 3 to 10 feet in thickness year-round. The depth to groundwater in this overburden unit has historically ranged from 4 to 10 feet below grade."*

Response: The language is correct; as the maximum of those two values is a total of 20 feet (10 saturated zone plus 10 feet depth to groundwater).

Comment 3: *Page 5, Section 2.1.3, second paragraph, first sentence – The overburden groundwater elevations shown on Figures 11, 12, and 13 also decrease moving from northeast to southwest. Provide an explanation of why the potential southwesterly movement of groundwater is being discounted.*

Response: Within the OU2 unconfined aquifer, groundwater flow has both vertical and horizontal components and is generally controlled by the structural surface of the bedrock trough that has been delimited and characterized through the investigations to date. Our interpretation of the groundwater flow directions is based on the depth to water measurements collected in the field during the PDI and on our understanding of the structural features controlling flow. Figures 11, 12 and 13 are representative of the groundwater potentiometric surface at the time of their respective groundwater depth measurements.

Comment 4: *Page 11, Section 3.1, last bullet – Please correct year date 2012 to 2013.*

Response: Corrected.

Comment 5: *Page 12, Section 3.2.1, last paragraph on page – Please explain why step-off locations were not advanced for TW41, TW42, and TW43.*

Response: The field selection of step-off locations was informed through our knowledge of the subsurface structure and conditions in the field in real time. Our approach and the step-off logic were discussed with USEPA and/or their contractors during the PDI. Step-off

locations were not advanced for TW42 and TW43, because proximal locations TW32 and TW44 were dry and are closer to the deeper portion of the bedrock trough. Given the topography of the bedrock, a step-off south of TW44 (TW44A) produced water, and a step off east of TW32 produced water, which aligns with the bedrock trough. Completing a step-off in the other direct push points in this area was not necessary as the depths of refusal continued to become shallower.

Similarly, TW41 was dry and a step-off was not completed as this location was oriented in the direction of bedrock strike and locations at which TCE was not detected.

Comment 6: *Page 13, Section 3.2.2, second paragraph – Consider revising the last sentence of the second paragraph; it is confusing.*

Response: Disagree. Language is clear.

Comment 7: *Page 13, Section 3.2.2, second bullet – Please clarify the meaning of the phrase "stabilized water level greater than 0.3 feet" at the end of the last sentence. Is this intended to mean drawdown greater than 0.3 feet?*

Response: The water level was maintained within 0.3 feet from the starting groundwater elevation. Therefore, drawdown was maintained to be less than 0.3 feet; or as stated in the text, groundwater elevation (i.e., level) was greater than 0.3 feet. Groundwater drawdown is a measure downwards, and groundwater elevation / level is a measure upwards.

Comment 8: *Page 13, Section 3.2.2, first sentence of last paragraph – Replace "observation of first water" with "infiltration of groundwater" to clarify the statement.*

Response: Replaced.

Comment 9: *Page 14, Section 3.2.2, last sentence – Change the word "sampled" to "samples".*

Response: The word in the narrative was already "samples", no change necessary.

Comment 10: *Page 15, Section 3.2.4, second paragraph – Replace "has been delineated as shown on Figure 6" with "is shown on Figure 6." The word "delineation" implies that the plume boundaries have been defined. As shown on Figure 6, the plume is not defined to the TCE MCL west or north of the westernmost sample locations.*

Response: Text has been modified as requested.

Comment 11: *Page 15, Section 3.2.4, third paragraph – Recommend collecting samples north of TW45, which has an unbounded TCE detection of 34 µg/L, north of TW49, and west of TW51.*

Response: The delineation samples recommended within the 60% Design meet the requirements of the UAO / Interim ROD. These additional samples are not necessary to define the 100 µg/L OU2 overburden aquifer treatment zone, and will not be collected.

Comment 12: *Page 15, Section 3.2.4, fourth paragraph – Eliminate this paragraph. The DCE and TCE concentration data do not necessarily indicate the presence of "two distinct sources". There are no gaps in the TCE or DCE plumes, and the single result from TW04 (which shows almost 500 µg/L of TCE and 58 µg/L of DCE) should not be used to conclude that there are two distinct sources. The somewhat lower concentrations at the TW04 location could also be the result of heterogeneity of the bedrock (no fractures in the area) or overburden.*

Response: When taken with the historic data, the CSIA results indicate two vintages of TCE along with the two elevated concentration areas, and further evidenced by knowing TCE concentrations existed in this northwestern corner of the former BAE facility predating Stabilus. There is a strong likelihood of two sources. As discussed during the 22 and 23 January 2014 technical calls, the word "may" was added to the narrative.

Comment 13: *Page 16, Section 3.3.1, first paragraph – Change "no measure" to "no readings".*

Response. Changed.

Comment 14: *Page 17, Section 3.3.3, first paragraph – Delete the word "marginal" from the second sentence. Based on the data on table 6, SSL for TCE was exceeded at locations SB02 through SB09, but the text indicates that the sample from SB01 also exceeded the TCE SSL. Correct the text to reflect or the table so that they are consistent. Separately, the MCL-based SSL is more than an order of magnitude higher than the risk-based groundwater protection SSL. Provide the rationale for using the higher number.*

Response: Changed. As noted during the 22 and 23 January 2014 technical calls, the focus of the soils investigation was to understand the concentration of TCE within soils for remedial action.

Comment 15: *Pages 18 and 19, Section Headings 3.5, 3.5.1, and 3.5.2 – Change "Groundwater Monitoring" to "Groundwater Elevation Monitoring".*

Response: Changed.

Comment 16: *Page 20, Section 3.6, last sentence – Eliminate the word "planned" if the microcosm construction, incubation, sampling, and analysis were carried out as indicated in the 30% design. Otherwise, indicate any method variations and reasons for the variations.*

Response: The word "planned" is appropriate here as the planned approach was documented within the 30% Design which is referred to within this sentence. The details of the executed treatability study were presented within the 60% Design.

Comment 17: *Page 21, Section 3.7, first paragraph, first sentence – Please revise to avoid the implication that the TCE plume boundary has been delineated. As shown on Figure 6, the plume has not been defined to the TCE MCL along its western boundary and north of TW45 and TW49. If delineation is referring only to the 100 µg/L contour, then this definition of delineation needs to be clarified in the report.*

Response: The delineation of TCE to 100 µg/L is the requirement of the UAO and Interim ROD for the implementation of the OU2 overburden aquifer remedy. Text has been modified.

Comment 18: *Page 21, Section 3.7, first paragraph – If groundwater flows predominantly along the overburden/bedrock interface as stated in the text, please explain the groundwater flow directions shown on Figures 11, 12, and 13, which are approximately perpendicular to the trough. This clarification is also important given that groundwater elevations also decrease toward the southwest.*

Response: See response to "Specific Comments – Comment 3".

Comment 19: *Page 21, Section 3.7, first paragraph – Why was a maximum saturated thickness of 5 feet assumed? Section 2.1.3 indicates that saturated zone thickness has been historically between 3 feet and 10 feet. A table or figure with the observed or calculated saturated zone thicknesses should be added to back up this assertion. Comment applies to Section 4.1 and throughout all calculations.*

Response: The range of elevation or potentiometric elevation of groundwater can be as high as 10 feet, but as noted in the text the groundwater flow is predominantly within the lower portion of the overburden aquifer. The groundwater flow zone within the overburden aquifer is believed to be approximately 5 feet on average.

Comment 20: *Page 23, Section 3.8, Bullet 5 – Change "and only slightly exceed the USEPA Region 3, 6, 9 PGW-MCL value for TCE of 0.0018 mg/kg" to "but they exceed the USEPA Region 3, 6, 9 PGW-MCL value for TCE by an order of magnitude or more in multiple areas". Most TCE results are one to two orders of magnitude greater than the stated SSL.*

Response: See response to "Specific Comments – Comment 14".

Comment 21: *Page 25, Section 4.1, first paragraph, second sentence – The buffering solution has been omitted from the amendments. Please modify the text to specify the buffering solution that will be used.*

Response: The buffering solution to be used will be included within the Revised Design Criteria Report as part of the 90% Design. The text has been modified to add the word "buffered" where appropriate when electron donor and EVO are mentioned to avoid confusion.

Comment 22: *Page 25, Section 4.1, first paragraph, third sentence – The text incorrectly indicates that the "extent and location of TCE within the OU2 overburden aquifer is presented on Figure 6." The TCE contamination has only been characterized to the 100 µg/L level and additional TCE contamination is likely present in the overburden but not depicted on Figure 6. Modify the text to reflect this.*

Response: Per the UAO and Interim ROD, the OU2 Overburden Groundwater Aquifer remedy is only required to treat to the 100 µg/L contour; thus, this is a correct statement given the PDI was completed to delineate the area for the RA. The text has been modified.

Comment 23: *Page 25, Section 4.1, first paragraph, fourth sentence – Add the word "proposed" before EISB treatment area.*

Response: Agreed. Text has been modified as requested.

Comment 24: *Pages 25 and 26, Section 4.1, third paragraph – The proposed amendment distribution method does not appear to be the most appropriate to achieve maximum radial distribution. It seems more likely that the amendments will travel downward into bedrock fractures and upward into the disturbed trench materials before they move outward into the undisturbed overburden. While movement along the bedrock/overburden interface is also possible, the document does not describe what mechanism would then drive amendments up into the low permeability contaminated overburden after it has spread along the interface. Please modify the text to address these issues and consider other methods of delivering amendment to the contaminated low permeability overburden areas.*

Response: The trench application is the most appropriate for low permeability soils. As presented during the 6 November 2013 technical meeting the trench approach has the following benefits:

- increase the flux, as more surface area with the overburden aquifer,
- larger interface with lower overburden-bedrock interface zone,
- allow for the gravity displacement of buffered EVO,

- apply buffered EVO over a longer period of time and higher volume, and
- easier re-application and addition of buffered EVO as needed.

Further details regarding the trench application will be included within the Revised Design Criteria Report as part of the 90% Design.

Comment 25: *Page 26, Section 4.1, EISB Implementation Sequence – The buffering solution has been omitted. Please modify the text to specify the buffering solution that will be used, when it will be added, and how much will be added.*

Response: The buffering solution was not omitted by was implied as part of the EVO application based upon the EISB treatability testing results. As discussed during the 22 and 23 January 2014 technical calls, the EISB Implementation Sequence will be modified to clarify the use of a buffering solution within the Revised Design Criteria Report as part of the 90% Design

Comment 26: *Page 27, Section 4.2.2 – Add RCRA requirements as necessary to address possible transportation and disposal of contaminated trench spoils and other waste materials.*

Response: Agreed. Will be included within the Revised Design Criteria Report as part of the 90% Design

Comment 27: *Page 32, Section 4.3.3, first paragraph, last sentence – Indicate whether flushing will be done with water or whether some amendment will be added.*

Response: Details of the timing and amendments will be included within the Operations and Maintenance Manual and Revised Design Criteria Report as part of the 90% Design.

Comment 28: *Page 35, Section 5.1, fourth bullet – The design assumes that water in well RI27D is appropriate for use in preparing the amendment solution. The text should indicate the basis for this assumption. Has testing of this well been completed to confirm this assumption? If not, when will such testing be performed? If so, when was the well sampled, and do the analytical results demonstrate that the groundwater will be suitable for use as makeup water?*

Response: See comments above to "RPM – Comment 12". Will be incorporated into the 90% Design and will be a requirement of the RA Contractor to confirm and have a contingency for water if necessary.

Comment 29: *Page 35, Section 5.1, fifth through eighth bullets – When will these assumptions be confirmed? At the 60% design stage, these factors should be known quantities.*

Response: Per the RDWP, the RD submitted as part of the 60% Design was a Preliminary RD. These assumptions will be confirmed as part of the 90% Design.

Comment 30: *Page 37, Section 5.1.2 – Per page 36, 11.2 EVO batches will be injected through the infiltration trench. After multiple batches have been injected, one batch will be bioaugmented and then the remaining batches will be injected. How will the timing of the bioaugmented batch be determined? Will it be based on field parameter monitoring in the overburden wells located near the trench centerline?*

Response: The KB-1 will be added when the conditions for the OU2 overburden aquifer are sufficiently anaerobic. Details of the timing for the bioaugmented batch will be provided within the Operation and Maintenance Manual as part of the 90% Design.

Comment 31: *Page 38, Section 5.2.1, third paragraph, second sentence – Given that geotechnical analysis was conducted on only one sample from one boring, how was the determination made that the "overburden soil is consistent across the Site"? Provide the basis of this determination.*

Response: Geosyntec advanced borings across the Site and had the benefit of evaluating and observing the properties of the overburden soils at each location. The soils were analyzed at one location to confirm these visual observations and the preponderance of lithological interpretation collected by Geosyntec and other investigations over decades describing soils as silts and clays provides the basis of our statement reading the general consistency of the overburden soils. The low hydraulic conductivity observed during low flow sampling and development of the wells, visual observation of the soil lithology during the completion of the various soil borings, and observation of standing water on the ground surface for days following a rain event confirmed that the soils are of a low permeability.

Comment 32: *Page 38, Section 5.2.1, third paragraph – Describe the lithology and soil characteristics of the "zone of unquantified thickness".*

Response: Text has been added.

Comment 33: *Page 42, Section 8.1 – The first paragraph identifies installation of 10 new overburden wells, but 11 new overburden wells are specified in Section 8.2.1. Please resolve this discrepancy.*

Response: Based upon the 22 and 23 January 2014 technical calls a total of 11 new overburden monitoring wells will be installed. These include 10 performance monitoring wells, and 1 additional well north of the former loading dock area. Therefore, both are correct. 11 new overburden wells will be installed, and 10 of these wells will be used to

monitoring the Phase 1 EISB performance. The text has been modified to provide further clarity.

Comment 34: *Page 43, Section 8.2.1, first bullet – Reword this sentence for clarity. Also, the last well should be 25 ft (not 20 ft) from the centerline of the trench according to Drawing 3 and previous discussions with the PRP.*

Response: Sentence has been reworded. The drawings will be updated as part of the 90% Design.

Comment 35: *Page 45, Section 8.3.2 – Schedule 80 PVC is not required for these well depths. Explain the need for this material.*

Response: Disagree. The deeper wells constructed with Schedule 40 PVC may not run true vertically. Schedule 80 PVC is recommended to minimize the well from bending during installation.

Comment 36: *Page 48, Section 8.8, fifth sentence – Eliminate the sentence, "The success of the remedy as a whole is dependent upon successful distribution of the biostimulant." While the statement is true to some extent, the overall success of the remedy will be to achieve the cleanup requirements specified in the ROD.*

Response: Agreed. Sentence has been deleted.

Comment 37: *Figure 8 – Eliminate the BAE and Stabilus labels from the figure. The data, particularly those from the TW03 and TW06 samples, do not support the assignment of different CSIA results to different companies.*

Response: Disagree. The CSIA results clearly indicate that there at two distinct types of TCE present within the OU2 overburden aquifer. As Stabilus has documentation that they consistently used the same vendor and distributor, the less degraded TCE (~-22) is probably from their operations. The older TCE (~ -19) which is more degraded is from historic operations that were present in the OU2 area prior to Stabilus existence at the Site. Given the only historic operations that existed prior to Stabilus in this area were conducted by BAE, the other source is very likely from BAE. Additionally, there was observed area wide TCE contamination observed in this area within very shallow bedrock within months of Stabilus beginning operations. Given the very low permeability of the overburden aquifer, this TCE is likely from other sources. BAE was the former owner of the Stabilus parcel as well as the Whistlestop Park parcel, which has and currently still has TCE present. Again, the variability in the observation of TCE signature could easily be from historic spills or

releases in the area prior to the addition of the Stabilus release, and comingling of the two TCE plumes with time.

Comment 38: *Appendix H, Drawing 3 – An EISB application well is included outside of the trench on this drawing. Application of amendments through such a well is contrary to the method proposed in Section 4.1. Correct the drawing, or modify the text to be consistent.*

Response: The drawing will be corrected as part of the 90% Design.

Comment 39: *Appendix H, Drawing 6, EISB Trench Details – Please indicate how far above the bedrock the pea gravel will extend on Section A. Also, on Section A, "clean fill" is shown overlying the pea gravel, but on Section B, either "clean fill or excavated soil" is shown overlying the pea gravel. Please ensure consistency between the two sections.*

Response: The drawings will be clarified as part of the 90% Design.

CLOSING

If you have any questions, please do not hesitate to contact me.

Sincerely,

Derek W. Tomlinson, P.E.
Project Coordinator

Attachment: Revised 60% Design dated 17 February 2014
Redline Revised 60% Design dated 17 February 2013 *(via email only)*

cc: Dennis Kutz, PADEP *(via email & 1 hardcopy first class mail)*
M. Joel Bolstein, FoxRothschild
Chris Voci, P.G., Geosyntec
File: PH0013